

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of claims

1-15. **(Canceled)**

16. **(Previously Presented)** An isolated proton-gated cation channel comprising a subunit which comprises the amino acid sequence of SEQ ID NO: 2.

17. **(Previously Presented)** A channel according to claim 16, which is a homopolymeric channel.

18. **(Previously Presented)** A channel according to claim 16 which is a heteropolymeric channel.

19. **(Previously Presented)** A channel according to claim 18 comprising at least one subunit which belongs to the degenerin/ENaC channel superfamily.

20. **(Previously Presented)** A channel according to claim 18, comprising at least one subunit which belongs to the P2X ATP-gated channel family.

21. **(Previously Presented)** A channel according to claim 20, wherein the P2X family sub-unit is P2X2.

22-37. **(Canceled)**

38. **(Currently Amended)** An isolated ~~human~~ proton-gated cation channel comprising a subunit that comprises an amino acid sequence that is at least 85% identical to the amino acid sequence of SEQ ID NO: 2, wherein the proton-gated cation channel displays a biphasic current when activated by an extracellular proton concentration which is below physiological pH, and wherein the slow component of the biphasic current is inhibited by amiloride.

39. **(Canceled)**

40. **(Previously Presented)** A channel according to claim 38, wherein the amino acid sequence of the subunit differs from the amino acid sequence of SEQ ID NO: 2 by a substitution of one or several amino acid residues, and wherein the channel retains the functional properties of a channel comprising a subunit consisting of the amino acid sequence set forth in SEQ ID NO: 2.

41. **(Previously Presented)** An isolated subunit of a human proton-gated cation channel, wherein the subunit comprises the amino acid sequence of SEQ ID NO: 2.

42. **(Currently Amended)** An isolated subunit of a ~~human~~ proton-gated cation channel, wherein the subunit comprises an amino acid sequence that is 531 amino acids in length and is greater than 85% identical to the amino acid sequence of SEQ ID NO: 2.

43. **(New)** An isolated subunit of a human proton-gated cation channel, wherein the subunit consists essentially of the amino acid sequence of SEQ ID NO: 2.

44. **(New)** An isolated subunit of a proton-gated cation channel, wherein the subunit is encoded by a nucleic acid molecule which hybridizes to the nucleic acid molecule of SEQ ID NO:1, wherein the hybridization occurs at about 65°C and in 5X SSPC and 50% formamide.